RSC Advances, 2015, vol.5, N81, pages 65674-65683

Synthesis and properties of novel polyurethanes based on amino ethers of boric acid for gas separation membranes

Davletbaeva I., Emelina O., Vorotyntsev I., Davletbaev R., Grebennikova E., Petukhov A., Akhmetshina A., Sazanova T., Loskutov V.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© The Royal Society of Chemistry. Herein we present the structural and mechanical properties of polyurethanes synthesized from amino ethers of boric acid for gas separation. The polymers were characterized by light scattering methods, conductivity measurements, thermal gravimetric analysis, Fourier transform infrared spectroscopy, and atomic force microscopy. Additionally, the permeability of ammonia and carbon dioxide, as well as the selectivity for their diffusion and resultant impurity are presented. The results illustrate the steric hindrance, resulting in a branched architecture borate formation, leads to intermolecular complexation which may assist the polymer in ammonia diffusion selectivity.

http://dx.doi.org/10.1039/c5ra11417a